(12) UK Patent Application (19) GB (11) 2 309 896 (13) A

(43) Date of A Publication 13.08.1997

(21) Application No 9602618.2

(22) Date of Filing 09.02.1996

(51) INT CL[6]
A47C 27/15

(52) UK CL (Edition O)
A4M M1DX M1D4

(56) Documents Cited
GB 2274054 A GB 0978164 A EP 0114762 A

(58) Field of Search
UK CL (Edition O) A4M
INT CL[6] A47C
OMLINE DATABASE:WPI

(71) Applicant(s)
Recticel Limited

(Incorporated in the United Kingdom)

Bluebell Close, Clover Nook Industrial Park, ALFRETON, Derbyshire, DE55 4RD, United Kingdom

(72) Inventor(s)
Paul John Howes

(74) Agent and/or Address for Service
Hughes Clark & Co
114-118 Southampton Row, LONDON, WC1B 5AA, United Kingdom

(54) MATTRESS

(57) A pressure reducing mattress for use on undulating or angled beds has on each face a divided length (2, 3, 4, 5, 6) of comparatively soft foam bonded to a core (1) of harder foam, the sections of softer foam being bonded to the core with gaps between them. Transverse holes (9) and cuts (8) are formed in the core at eight places at which the mattress can be bent.

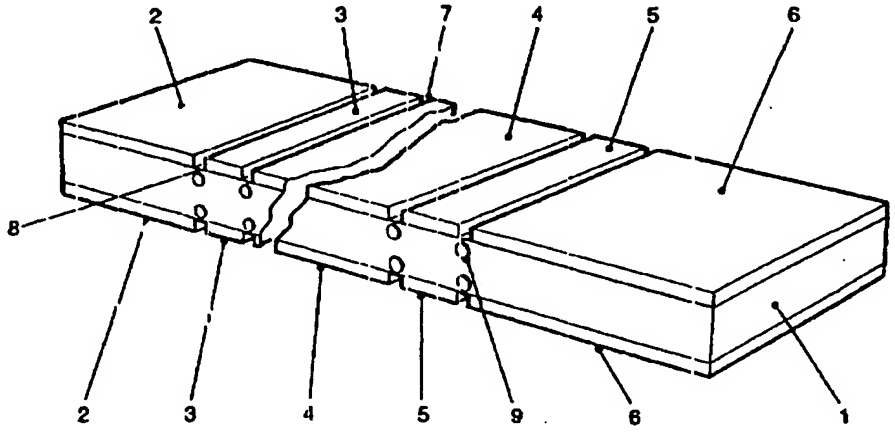

FIG 1

GB 2 309 896 A

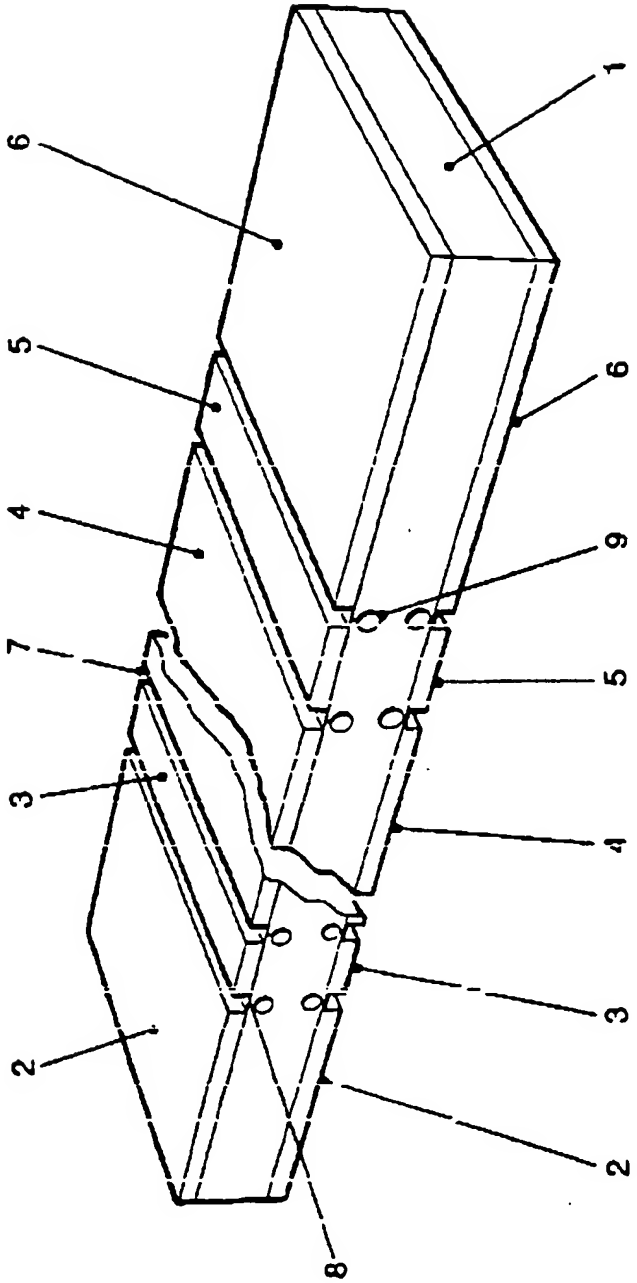

FIG 1

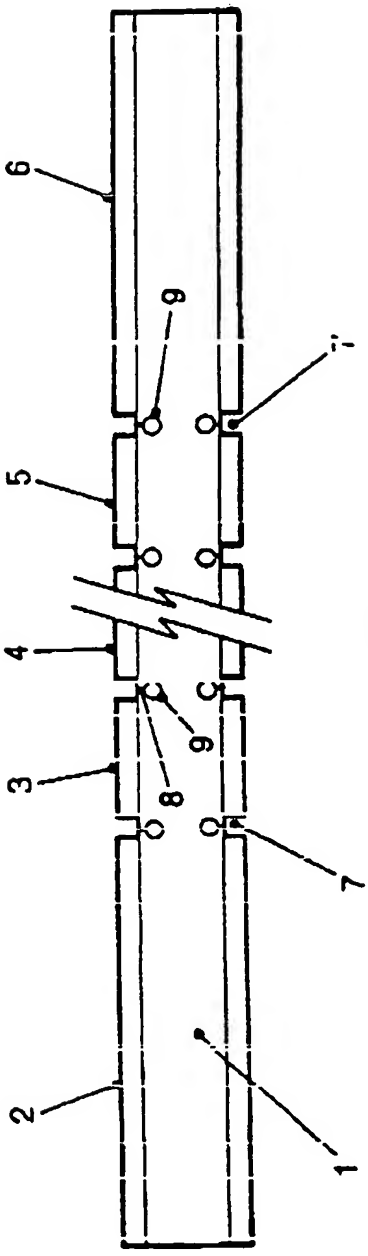

FIG 2

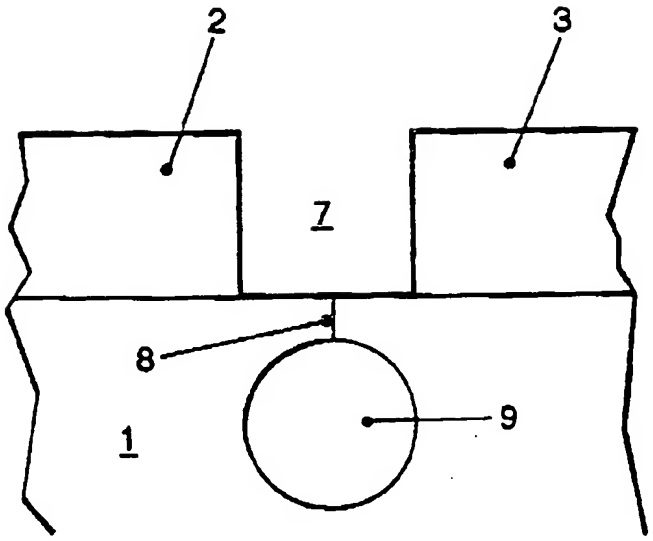

FIG 3

2309896

PRESSURE REDUCING MATTRESS

This invention relates to pressure reducing mattresses.

Pressure reducing mattresses are used in hospitals and the community to prevent the onset of pressure sores, particularly in the elderly and any person laying down for long periods. The vast majority of pressure reducing mattresses are designed to be used flat. In certain treatments and circumstances it is desirable to position the patient in various angled and sitting positions and such bending is detrimental to the pressure reducing qualities of conventional pressure reducing mattresses.

An object of the present invention, therefore, is to provide a mattress which can maintain its pressure reducing qualities, even when bent to accommodate undulating and angled beds.

According to the present invention, a pressure reducing mattress comprises over its entire body supporting area a core of comparatively hard material capable of being temporarily deformed under load and a layer of comparatively softer material bonded over a face of the core and operative to provide pressure reducing support for the user of the mattress, the softer material being divided into sections transversely across the mattress at locations between the ends of the mattress and the harder core being formed so as to be capable of bending in the vicinities of said lines for the mattress to become adapted to different forms of support on which it may be located.

Preferably the core is formed with opposed faces so that either one of the faces can be positioned uppermost when the mattress is in use, two said layers of comparatively soft material being bonded respectively to the two faces, so that the mattress can be used either way up with the same effect, the two said layers being substantially identical. The divided layers of

comparatively soft material may also be positioned so that the mattress can also be used either way round (*i.e.* head and foot ends reversed).

In order that the invention may be clearly understood and readily carried into effect, a pressure reducing hinged mattress in accordance therewith will now be described, by way of example, with reference to the accompanying diagrammatic drawings, in which:

Fig. 1 is a perspective view of the mattress;

Fig. 2 is a schematic side view of the mattress of Fig. 1, not drawn to scale; and

Fig. 3 is a side view of a detail on an enlarged scale of the mattress of Figs. 1 and 2.

The mattress shown in the drawings comprises a centre core 1 which, in this particular example, is 77 inches (195.58 cm) long and 4 inches (10.16 cm) thick and width according to requirement. The centre core 1 consists of comparatively hard foam and has softer foam bonded to each face in sections 2, 3, 4, 5, 6. There are one inch (2.54 cm) gaps 7 between these sections, each of which is one inch (2.54 cm) thick. The sections 2 and 6 are 21 inches (53.32 cm) long, the sections 3 and 5 are each 6 inches (15.23 cm) long and the section 4 is 19 inches (48.24 cm) long. The softer foam is bonded to both sides of the harder foam centre core so that both sides of the mattress can be used, thereby ensuring long mattress life.

The softer foam layers 2 to 6 are bonded to the harder centre core 1 by a solvent-based or water-based adhesive. The gaps 7 between the sections enable the mattress to bend without distorting the soft foam.

The harder core foam 1 is profile cut using a CNC profile cutter at the bonding points between the softer foam sections to provide ¼ inch (0.63 cm) slits 8, each extending from a surface of the centre core to a one inch (2.54

cm) diameter hole 9 extending across the whole width of the mattress. As shown in Fig. 1 a transverse individual slit 8 and hole 9 is associated with each gap 7 on each face of the mattress. The combination of the sectioned softer foam layers and the eight slits and holes in the central core foam enable the core foam to bend without deforming either of the outer layers of softer foam.

The specific densities of both the hard and soft foam combinations vary with patient requirements. The softer foam on the outside surfaces of the mattress is polyurethane foam of general density 38 kg/cu metre and 110-140 Newtons hardness (BS 4443 pt 2 method 7A, 1988). The harder foam for the core of the mattress is polyurethane foam of general density 40 kg/cu metre and 150-180 Newtons hardness (BS 4443 pt 2 method 7A, 1988). The soft foam areas may also be varied to a number of densities depending on patient requirements.

The mattress is covered in an impermeable weft knitted nylon transfer coated polyurethane two way stretch cover. The cover is either welded or stitched and with or without a zip. The gaps in the softer foam material enable excess cover fabric to fold into the gaps when the mattress is folded. This prevents the patient from laying on fabric folds, which can be uncomfortable and can destroy the pressure reducing properties of the mattress.

The softer foam material may also be profile cut (*e.g.* into an egg box shaped profile), cross-cut (into rectangles) or castellated (cut into small "castles").

CLAIMS:

1. A pressure reducing mattress comprising over its entire body supporting area a core of comparatively hard material capable of being temporarily deformed under load and a layer of comparatively softer material bonded over a face of the core and operative to provide pressure reducing support for the user of the mattress, the softer material being divided into sections transversely across the mattress at locations between the ends of the mattress and the harder core being formed so as to be capable of bending in the vicinities of said locations for the mattress to become adapted to different forms of support on which it may be located.

2. A mattress according to Claim 1, in which the core is formed with opposed faces over the said area, so that either one of the faces can be positioned uppermost when the mattress is in use, two said divided layers of comparatively soft material being bonded respectively to the two faces, so that the mattress can be used either way up with the same effect, the two said layers being substantially identical.

3. A mattress according to Claim 2, in which the divided layers of comparatively soft material are positoned so that the mattress can also be used either way round (*i.e.* head and foot ends reversed).

4. A mattress according to any one of the preceding claims, in which the divisions in the softer material are constituted by gaps between sections of the softer material.

5. A mattress according to any one of the preceding claims, in which the divisions between the layers of comparatively soft material follow straight lines transversely across the mattress.

6. A mattress according to Claim 5, in which a transverse hole is formed in the core material beneath each division in the softer material and is connected by a transverse slit to the adjacent core face.

7. A mattress according to any one of the preceding claims, in which the materials used respectively for the harder core and softer sections are two grades of polyurethane respectively.

8. A mattress according to Claim 7, in which the softer foam is polyurethane foam of general density 38 kg/cu metre and 110-140 Newtons hardness (BS 4443 pt 2 method 7A, 1988), the value being chosen to suit patent requirement.

9. A mattress according to Claim 7, in which the harder foam for the core of the mattress is polyurethane foam of general density 40 kg/cu metre and 150-180 Newtons hardness (BS 4443 pt 2 method 7A, 1988).

10. A mattress according to any one of the preceding claims, in which the layer or each such layer is divided into five sections, consisting of three comparatively long sections located respectively close to the ends of the mattress and centrally of the mattress and two comparatively short sections respectively located in spaces between the longer sections with gaps between adjacent pairs of sections.

11. A mattress according to any one of the preceding claims, in which the sections of softer material are bonded to the harder core by a solvent-based or water-based adhesive.

12. A mattress according to any one of the preceding claims, provided with an impermeable stretch cover.

13. A pressure reducing mattress substantially as hereinbefore described with reference to the accompanying drawings.

The Patent Office

Application No: GB 9602618.2
Claims searched: 1-13

Examiner: John Graham
Date of search: 10 April 1996

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.O): A4M

Int Cl (Ed.6): A47C

Other: ONLINE DATABASE: WPI

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
X	GB 2274054 A	(WELCH) see eg page 6 lines 12- 20	1-9,11,12
X	GB 978164	(DUNLOP) see Fig 5	1
X	EP0114762	(SUPPORT) whole document and WPI abstracts	1-9,11,12

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.